

Appl. No. 10/805,817
Atty. Docket: 2001B007B/2
Amendment dated November 16, 2005
Reply to Office Action mailed August 23, 2005

REMARKS/ARGUMENTS

Status and Request for Reconsideration

Reconsideration of this application is requested. The claims submitted for reconsideration are claims 1-11, 13-14, 54-64, and 66.

Independent claims 1 and 54 have been amended to include the subject matter of now canceled claims 12 and 65, respectively. Accordingly, no new matter has been entered.

Claim Rejections – 35 U.S.C § 103

Claims 1, 3-6, 8-14, 54, 56-59, and 61-66 have been rejected under 35 U.S.C § 103(a) as being unpatentable over U.S. Patent No. 4,579,999 (Gould) in view of U.S. Patent No. 4,474,647 (Asselineau). This rejection is traversed and reconsideration requested.

This invention is directed to various methods of making an olefin oligomer. The inventors have found that the acid based oligomerization catalysts used in this invention are adversely sensitive to oxygenated hydrocarbons that can be found in various olefin feeds. Non-limiting examples of oxygenated hydrocarbons to which the acid based catalysts are adversely sensitive include alcohols, aldehydes, ketones, ethers, and carboxylic acids.

According to one embodiment of this invention, a hydrated olefin feed stream that is relatively low in oxygenated hydrocarbon content is used to contact an oligomerization catalyst and form an oligomerized olefin. Applicants have found that using such a hydrated olefin as the oligomerization feed substantially increases life of the oligomerization catalyst. See page 17, paragraph [0065], of the specification.

The Gould reference discloses a process for converting oxygenated feedstock to liquid hydrocarbons. In a primary catalyst stage, the feedstock is contacted with zeolitic catalyst to produce various olefins and other hydrocarbons. In a secondary catalytic stage, propylene is predominately oligomerized to form gasoline or distillate liquids. A technique for recovering and recycling lower alkenes to the primary catalytic stage is also described.

Applicants' claimed invention differs from the Gould process in that the Gould process provides no step of removing oxygenated hydrocarbon from an olefin stream to form an olefin feed stream having less than 1,000 wppm oxygenated hydrocarbon, and then contacting the

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olefin feed stream with an acid based oligomerization catalyst to oligomerize the olefin in the feed stream. In addition, the Gould process does not disclose or suggest hydrating the olefin feed stream prior to contacting with the oligomerization catalyst.

Asselineau was cited in the Office Action for generally teaching that the presence of water and dimethyl ether can block the olefin oligomerization reaction. Specifically, Asselineau indicates that an olefin stream recovered from a methyl tert-butyl ether (MTBE) or a tert-amyl methyl ether (TAME) reaction process is particularly beneficial for use as an oligomerization feed when water and dimethyl ether are removed.

The particular embodiment of the invention being claimed includes the use of a hydrated olefin feed stream to contact oligomerization catalyst and form an olefin oligomer. The use of a hydrated olefin essentially runs contrary to the teaching of Asselineau, since Asselineau indicates that both water and dimethyl ether should be removed from an olefin feed, i.e., a non-hydrated olefin should be used. Thus, the Asselineau process actually teaches away from Applicants' claimed invention. Accordingly, the combination of Gould and Asselineau fails to provide evidence of a prima facie case of obviousness.

Claims 2 and 55 have been rejected under 35 U.S.C § 103(a) as being unpatentable over Gould in view of Asselineau, and further in view of U.S. Patent No. 4,675,463 (Glivicky). This rejection is also traversed and reconsideration requested.

It was pointed out in the Office Action that Gould does not disclose the use of a PSA catalyst for oligomerizing olefins. However, Glivicky was considered to disclose the use of a PSA catalyst for oligomerizing olefins, and it was considered that the use of such a catalyst would have been obvious.

Applicants note that Glivicky has the same short comings as the combination of Gould and Asselineau. That is, Glivicky does not disclose removing oxygenate hydrocarbon from an olefin stream, and then using a hydrated olefin stream to contact the oligomerization catalyst. Accordingly, the combination of Gould, Asselineau and Glivicky fails to suggest Applicants' claimed invention.

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Claim 7 has been rejected under 35 U.S.C § 103(a) as being unpatentable over Gould in view of Asselineau, and further in view of U.S. Patent No. 5,026,933 (Blain). This rejection is also traversed and reconsideration requested.

It was noted in the Office Action that Gould does not disclose a step of selectivating a zeolite catalyst, but that Blain does disclose using a selectivated ZSM-23 for oligomerizing olefin. From this general disclosure, it was concluded that it would have been obvious to modify the Gould process by using the ZSM-23 catalyst disclosed by Blain to oligomerize olefins.

As in the case of Gould, Asselineau and Glivicky, Blain is also devoid of any teaching regarding removing oxygenated hydrocarbon from an olefin stream, and then using a hydrated olefin stream to contact an oligomerization catalyst. Accordingly, the combination of Gould, Asselineau and Blain also fails to suggest Applicants' claimed invention.

Double Patenting

All claims have been provisionally rejected under the doctrine of obviousness-type double patenting as being unpatentable over claims 1-44 of co-pending Application No. 10/201,203. In response, a Terminal Disclaimer is filed with this Amendment and Response. Accordingly, the provisional rejection of claims has been rendered moot.

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CONCLUSION

Having demonstrated that the cited references fail to disclose or suggest the invention as claimed, and all remaining objections and rejections have been overcome, this application is in condition for allowance. Accordingly, Applicant requests early and favorable reconsideration in the form of a Notice of Allowance.

If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated, since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response. Please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1712 (Docket #: 2001B007B/2).

Respectfully submitted,

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